UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/656,698	09/04/2003	Yoshiaki Tanaka	10844-35US (203070 (D-2))	8590

570 7590 09/22/2005

AKIN GUMP STRAUSS HAUER & FELD L.L.P.
ONE COMMERCE SQUARE
2005 MARKET STREET, SUITE 2200
PHILADELPHIA, PA 19103

EXAMINER	
VORTMAN, ANATOLY	
ART UNIT	**PAPER NUMBER**
2835	

DATE MAILED: 09/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/656,698	TANAKA, YOSHIAKI	
	Examiner	Art Unit	
	Anatoly Vortman	2835	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 August 2005 (Amendment)*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☐ Claim(s) *1-42* is/are pending in the application.

4a) Of the above claim(s) *See Continuation Sheet* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3,5,23 and 25* is/are rejected.

7)☒ Claim(s) *7,9,11,13,15,17,19,21,27,29,31,33,35,37,39 and 41* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Continuation of Disposition of Claims: Claims withdrawn from consideration are 2,4,6,8,10,12,14,16,18,20,22,24,26,28,30,32,34,36,38,40 and 42.

DETAILED ACTION

Amendment

1. The submission of the amendment filed on 08/18/05 is acknowledged. At this point claim 1 has been amended. Claims 1-42 are pending in the instant application. The even-numbered claims between 2 and 42 have been previously withdrawn from consideration as drawn to a non-elected invention.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1, 3, and 5, are rejected under 35 U.S.C. 103(a) as being unpatentable over JP/2002-25405 to Katsuhiko et al (cited on IDS) taken alone.

Regarding claims 1 and 3, JP/2002-25405 disclosed a thermal fuse (Fig. 2) having a fuse element (10) made of an alloy composition material comprising 41%-49% of Bi and 51%-59% of Sn (see p. 5, column 8, subsection [0038], and specifically lines 16-18 directed to examples A, B, and C)), wherein the thermal fuse element (10) is divided by the surface tension. JP/2002-

25405 also teaches Bi-Sn alloy, wherein Bi is 57% and Sn is 43% (see p. 3, column 3, subsection [0016], lines 22+).

JP/2002-25405 did not disclose the ranges as claimed, i.e. for Bi 50%-56% and balance is Sn (i.e. 44%-50%). However, the ranges taught by JP/2002-25405 are close to the ranges as claimed. Hence it would have been obvious to a person of ordinary skill in the relevant arts to adjust ranges of JP/2002-25405 in order to arrive to the claimed ranges, since a prima facie case of obviousness exists when the claimed range and the prior art range do not overlap but are close enough such that one skilled in the art would have expected them to have the same properties. *Titanium Metals Corp. v. Banner,* 778 F.2d 775, 783, 227 USPQ 773, 779 (Fed. Cir. 1985) (concluding that a claim directed to an alloy containing "0.8% nickel, 0.3% molybdenum, up to 0.1% maximum iron, balance titanium" would have been prima facie obvious in view of a reference disclosing alloys containing 0.75% nickel, 0.25% molybdenum, balance titanium and 0.94% nickel, 0.31% molybdenum, balance titanium), (see also *In re Peterson*, 65 USPQ2d 1379 (CA FC 2003)).

The normal desire of scientists or artisans to improve upon what is already generally known provides the motivation to determine where in a disclosed set of percentage ranges is the optimum combination of percentages. *See In re Boesch*, 617 F.2d 272, 276, 205 USPQ 215, 219 (CCPA 1980) ("[D]iscovery of an optimum value of a result effective variable in a known process is ordinarily within the skill of the art.").

Regarding claim 5, the alloy inherently contains inevitable impurities.

4. Claims 23 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP/2002-25405 in view of US/1,214,879 to Baruch.

Regarding claims 23 and 25, JP/2002-25405 teaches all as applies to claims 3 or 5, respectively, but fails to teach a heating element.

Baruch teaches a fuse (see Figure) comprising fusible member (4) surrounded by a heating element (6) for the purpose to decrease response time of the fuse during low current overload conditions (see column 3, lines 1+).

It would have been obvious to a person of ordinary skill in the fuse art at the time the invention was made to provide the fuse of JP/2002-25405 with a heating element as taught by Baruch in order to enhance the responsiveness of the fuse during low current overload conditions.

5. **Alternatively**, claims 1, 3, and 5, are rejected under 35 U.S.C. 103(a) as being unpatentable over JP/59-8231 in view of EP/2000-141079 to Hideo (cited on IDS).

Regarding claims 1 and 3, JP/59-8231 disclosed a thermal fuse (Fig. 1-4) having a fuse element made of an alloy composition material comprising Bi and Sn (p. 2, table 1, line 1), wherein the thermal fuse element is divided by the surface tension, but did not disclose the ranges as claimed for Bi and Sn.

Hideo disclosed a Sn-Bi alloy having Bi in a range of 25-55 wt.% and Sn in a range of 45-75 wt.%, said alloy is having an improved ductility and low manufacturing cost (see translated abstract).

It would have been obvious to a person of ordinary skill in the fuse art at the time the invention was made to use the alloy of Hideo for a fuse element of JP/59-8231 in order to provide said fuse element with an enhanced ductility subsequently reducing the manufacturing cost.

Further, since said ranges of the Sn and Bi in the JP/59-8231-Hideo combination are overlapping the ranges as claimed, it would also be obvious to a person of ordinary skill in the fuse art at the time the invention was made to select ranges for Sn-Bi alloy as claimed in claim 1, since a prima facie case of obviousness typically exists when the ranges of a claimed composition overlap the ranges disclosed in the prior art. E.g., *In re Geisler*, 116 F.3d 1465, 1469, 43 USPQ2d 1362, 1365 (Fed. Cir. 1997); *In re Woodruff*, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936-37 (CCPA 1976); *In re Malagari*, 499 F.2d 1297, 1303, 182 USPQ 549, 553 (CCPA 1974).

Regarding claim 5, the alloy inherently contains inevitable impurities.

6. Claims 23 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP/59-8231 in view of EP/2000-141079 and further in view of US/1,214,879 to Baruch.

Regarding claims 23 and 25, JP/59-8231 in view of EP/2000-141079 teach all as applies to claims 3 or 5, respectively, but fail to teach a heating element.

Baruch teaches a fuse (see Figure) comprising fusible member (4) surrounded by a heating element (6) for the purpose to decrease response time of the fuse during low current overload conditions (see column 3, lines 1+).

It would have been obvious to a person of ordinary skill in the fuse art at the time the invention was made to provide said combination of JP/59-8231 and EP/2000-141079 with a heating element as taught by Baruch in order to enhance the responsiveness of the fuse during low current overload conditions.

Allowable Subject Matter

7. Claims 7,9,11,13,15,17,19,21,27,29,31,33,35,37,39 and 41, are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Statement of reasons for the indication of allowable subject matter for the aforementioned claims has been presented in previous Office action.

Response to Arguments

8. Applicant's arguments have been fully considered but they are not persuasive.

The Examiner believes that Applicant's interpretation of JP/59-8231 is in error. The Examiner agrees that Bi-Sn binary alloy is used for an elastic force action type thermal fuse element, which uses a spring plate or a spring. However, the Examiner disagrees with the Applicant's reasoning while comparing the thermal fuse with solder (see p. 8 of the Amendment, lines 18-24). The Examiner believes that Applicant erroneously assumes that said solder is used for connection of the electronic component to the circuit board and should not melt. To the

contrary, said solder is used for restraining the elastic element of the fuse (i.e. a spring plate or a spring) and should melt upon overload condition in order to release said elastic element so as to disconnect the circuit. As such, said solder during normal operating conditions is always under tension (including the surface) from said elastic element, and the surface tension imposed by said elastic element upon said solder will inherently act as a dividing force upon melting of said solder during the overload condition.

Thus, in view of the above, the rejection of the claims presented in the outstanding Office action is believed to be proper and is maintained herein.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anatoly Vortman whose telephone number is 571-272-2047. The examiner can normally be reached on Monday-Friday, between 10:00 am and 6:30 pm..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ms. Lynn Feild can be reached on 571-272-2092. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Anatoly Vortman
Primary Examiner
Art Unit 2835

AV